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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/723,864

**Applicant(s)**

MURALIDHARAN, GIRSIH K.

**Examiner**

MARK D. FEARER

**Art Unit**

2443

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18, 20-23, 31-35 and 40-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18, 20-23, 31-35 and 40-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. Applicant's Amendment of 07 July 2008 is acknowledged.
2. Claims 15 and 41 are amended.
3. Claim 19 is cancelled.
4. Claims 1-18, 20-23, 31-35 and 40-49 are pending in the present application.

### *Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-2, 6, 9, 11-14, 42, 46 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040005094 A1) in view of Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) and in further view of Wiklof et al. (US 20050023356 A1).

Regarding claim 1. Huffman discloses a system wherein a server receives image data, a coefficient block scans pixel coordinates of the image data; and a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network (“In response to the client request, the server extracts transform data defined by the request.”) paragraph 0008 (“In one embodiment for image distribution, client application 460 generates a set of pixel coordinates to identify a portion of the source image 110 at a specified resolution. In turn, coefficient block request processing 420 maps the pixel coordinates at a specified resolution to coefficient coordinates.”) paragraph 0048 (“In general, the compression engine 140 compresses, using a lossless encoder technique, the pyramidal data representation(s) 130.”) paragraph 0020 (“The server transfers the compressed data to the client. The client decompresses the compressed data to obtain quantized data, and de-quantizes the quantized data to recover the transform data.”) paragraph 0008). However, Huffman fails to teach a plurality of network sensors for detecting network congestion. Machida discloses a system wherein network traffic is monitored and image data going across a network is adjusted accordingly. This reads on the claimed “... a plurality of network sensors in communication with the serving station and configured to provide network performance data to the serving station, wherein the serving station dynamically

modifies at least one of the scanning rate and the encoding format based on the network performance data.” (“Resolution which is adjusted by a slider 410 is automatically set in 1/2 of the highest resolution of the selected output device side, in consideration of traffic of the image data managed on the network. Further, it is assumed that the resolution which is identical or close to the automatically set resolution is automatically set as the resolution of the input device side.”) column 15 lines 36-42 (“... the network traffic quantity is always monitored by the management server.”) column 37 lines 28-29). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a network sensing apparatus as taught by Machida with an imaging system as taught by Huffman for the purpose of sending image data according to available network bandwidth. However, Huffman, as modified by Machida, fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation (“In accordance

with the principles of the present invention a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.") column 1 lines 43-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient

images and reports, or even for remotely controlled system operation as taught by Wood et al. with a system wherein a server receives image data, a coefficient block scans pixel coordinates of the image data; and a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network, network traffic is monitored and image data going across a network is adjusted accordingly as taught by Huffman, as modified by Machida, for the purpose of remote medical image analysis. However, Huffman, as modified by Machida and Wood et al., fails to disclose a method of modifying a scanning rate. Wiklof et al. discloses a method for illuminating a field-of-view and capturing an image wherein the scanning rate of image data can be varied (paragraphs 0025, 0073, 0077 and claim 36).

Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a method for illuminating a field-of-view and capturing an image wherein the scanning rate of image data can be varied as taught by Wiklof et al. with an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a system wherein a server receives image data, a coefficient block scans pixel coordinates of the image data; and a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network, network traffic is monitored and image data going across a network is adjusted

accordingly as taught by Huffman, as modified by Machida and Wood et al., for the purpose of remote image analysis.

Regarding claim 2, and as applied to claim 1 above, Huffman, as modified by Wood et al. and Wiklof et al., discloses a system wherein a serving station serves an image to a client. This reads on the claimed "The remote viewing system of claim 1, ... serving station ..." ("In a client-server embodiment, a client issues to a server a request for at least a portion of the source data. The request defines a block of the coefficients and at least one quantization value. In response to the client request, the server extracts transform data defined by the request. The transform data is quantized, in accordance with the quantization value, and is compressed to generate compressed data. The server transfers the compressed data to the client.") Huffman, paragraph 0008). However, Huffman, as modified by Wood et al. and Wiklof et al., fails to teach a system wherein the serving station comprises its own display. Machida discloses a system wherein a management server comprises a display apparatus. This reads on the claimed "... the serving station comprises a monitor for presenting image data to an operator." ("... information is displayed on a display apparatus of the PC or the management server of the demand sender.") column 21 lines 2-4).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a management server comprising a display apparatus as taught by Machida with an image serving station as taught by Huffman, as modified by Wood et al. and Wiklof et al., for the purpose of local administration of a server.



Regarding claim 6, and as applied to claim 1 above. Huffman, as modified by Machida and Wood et al. and Wiklof et al., discloses a remote viewing system wherein the serving station is in communication with an imaging system configured to detect a plurality of signals that are convertible into an image ((“ In general, multi-spectral transform data aggregates multi-components of the source image into a vector for the transform data. Through use of multi-spectral transform data, the wavelet transform may aggregate multi-dimensional data (e.g., two dimensional, three dimensional, etc.) for a source image.” ) Huffman, paragraph 0097), the imaging system configured to produce the image data ((For this embodiment, a medical imaging system optionally includes imaging equipment 700 to generate medical images 720 for optional storage in electronic form in an image archive 710. The image archive 710 contains electronic storage components such as disk drives and tape drives used to store the images in a highly reliable manner.” ) Huffman, paragraph 0090).

Regarding claim 9, and as applied to claim 1 above, Huffman, as modified by Wood et al. and Wiklof et al., discloses a system comprising a network. This reads on the claimed “The remote viewing system of claim 1, wherein the network ....” ((“The present invention is directed toward the field of data transfer, and more particularly toward compressing transform data for efficient distribution across a network.”) Huffman, paragraph 0002). However, Huffman, as modified by Wood et al. and Wiklof et al., fails to teach a system comprising a wide area network. Machida discloses a system

wherein two LANs are connected to form a WAN. This reads on the claimed "... the network comprises a wide area network." ("Basically, the WAN is composed of the plural LAN's which are connected together through a high-speed digital line such as ISDN (Integrated Services Digital Network). For example, as shown in FIG. 1, when the LAN 100 and the LAN 120 are connected with each other through a backbone 140, the WAN is established.") column 5 lines 1-6).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a wide area network as taught by Machida with a network as taught by Huffman, as modified by Wood et al. and Wiklof et al., for the purpose of large scale distribution of data.

Regarding claim 11, and as applied to claim 1 above. Huffman, as modified by Machida and Wood et al. and Wiklof et al., discloses a remote viewing system wherein a serving station receives a medical image ("For this embodiment, the medical imaging system includes at least one image server 730. As shown in FIG. 7, the image server 730 is coupled to a plurality of clients 740, 750 and 760. The medical images 720 are processed, by decomposition processing 120, to generate a pyramidal data structure 130.") Huffman, paragraph 0091).

Regarding claim 12, and as applied to claim 1 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein a medical image is presented to a served station comprising frame buffers (Wiklof et al., paragraph 0077).

Regarding claim 13, and as applied to claim 1 above, Huffman, as modified by Machida and Wood et al. and Wiklof et al., discloses a system wherein a client issues a request to the serving station ("To view portions of the image at the client, the client issues requests for data that include coefficient coordinates to identify coefficients in the hierarchical representation.") Huffman, paragraph 0006).

Regarding claim 14, and as applied to claim 1 above, Huffman, as modified by Wood et al. and Machida, discloses a system wherein a serving station receives input data. This reads on the claimed "The remote viewing system of claim 1, wherein the serving station receives ... input data ..." ("To view portions of the image at the client, the client issues requests for data that include coefficient coordinates to identify coefficients in the hierarchical representation.") Huffman, paragraph 0006) and the local serving station comprises an attached display and keyboard (Wood et al., Figure 15, items 242 and 234).

7. Claims 15-17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) and in further view of Benejam et al. (US 7133915 B2) and in further view of Mustafa (US 20020087716 A1).

Consider claim 15. Tokunaga et al. discloses a method for adapting screen updates based on network congestion, the method comprising: measuring network performance between a serving station and a served station ("The transmitting unit 17 has a data transmitting unit 2, a traffic detecting unit 3 and a communication data quantity adjusting unit 4, whereas the receiving unit 18 has a data receiving unit 12, a

data identifying unit 13, a display control unit 15 and a displaying unit 16.") column 5 lines 63-67), wherein the serving station provides screen data derived from an imaging system to the served station (("The data transmitting unit 2 of the transmitting unit 17 transmits image data to another image data communicating unit 19. The traffic detecting unit 3 detects the traffic of the network 20.") column 6 lines 1-4); and adjusting the screen data transmitted to the served station automatically based on the measurement of the network performance (("The communication data quantity adjusting unit 4 sets a transmittable number of image transferring frames on the basis of the traffic detected by the traffic detecting unit 3 to automatically adjust the quantity of communication data in the data transmitting unit 2 on the basis of the set number of frames.") column 6 lines 5-10). However, Tokunaga et al. fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation (("In accordance with the principles of the present invention a medical diagnostic ultrasonic imaging

system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.") column 1 lines 43-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation as taught by

Wood et al. with a method for adapting screen updates based on network congestion, the method comprising: measuring network performance between a serving station and a served station, wherein the serving station provides screen data derived from an imaging system to the served station, and adjusting the screen data transmitted to the served station automatically based on the measurement of the network performance as taught by Tokunaga et al. for the purpose of remote medical image analysis. However, Tokunaga et al., as modified by Wood et al., fails to disclose a method of remote image analysis comprising the remote frame buffer protocol. Benejam et al. discloses a method for offloading and sharing CPU and RAM utilization in a network of machines wherein Virtual Network Computing (VNC) comprises a remote display (VNC is built on the remote frame buffer protocol) (column 1 lines 33-56). Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a method for offloading and sharing CPU and RAM utilization in a network of machines wherein Virtual Network Computing (VNC) comprises a remote display as taught by Benejam et al. with an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a method for adapting screen updates based on network congestion, the method comprising: measuring network performance between a serving station and a served station, wherein the serving station provides screen data derived from an

imaging system to the served station, and adjusting the screen data transmitted to the served station automatically based on the measurement of the network performance as taught by Tokunaga et al., as modified by Wood et al., for the purpose of remote medical analysis. However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to disclose a method of remote image analysis comprising a method of adjusting a frame buffer scanning algorithm. Mustafa discloses a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames wherein a frame buffer algorithm recognizes loss in expected sub-frame sequence and adjusts its execution accordingly ("Returning to step 293, if there is already a sub-frame in the holding buffer then the algorithm proceeds to step 296. In this step 296 the algorithm reads the 7-bit sequence number of the previous received sub-frame in the service holding buffer. If there is no sub-frame loss then it is expected that the present sub-frame sequence number is the next logical sequence number then the previous stored sub-frame . The decision box 297 determines this condition. If the present sub-frame sequence number is incremented from the previous sub-frame then the algorithm proceeds to step 300 where it strips off all the header information and the last three bytes (2-bytes CRC and 1 sub-framing byte). It stores the sub-framing byte information to be used for the sequence comparison with the next sub-frame. Only the data portion is appended with the previous sub-frame data as shown in conjunction with FIG. 8. In step 301 the status of the LS bit is determined. If the present sub-frame has LS bit set to 1 it indicates that the present sub-frame contains the last segment of a frame and it has completed all the segments of the received frame. If so, the algorithm

moves to step 302 and then to step 303.") paragraph 0121 ("As shown in the FIG. 19A, the sub-frame 313 is either lost during the transmission or has been received as an invalid sub-frame. In both cases no useful information about the d3 portion contained in the sub-frame 313 can be extracted and the sub-frame 313 is dropped. The service algorithm recognizes this loss of the sub-frame in step 297 as illustrated in FIG. 18. Since the essential segment of the original frame had been lost the remaining two sub-frames 311 and 312 can not reproduce the information as transmitted in the frame. As a result, the service algorithm proceeds to discard all the sub-frames in the buffer (sub-frames 311 and 312). This action corresponds to step 298 of the service algorithm in FIG. 18. After discarding the data it proceeds with the assumption that the sub-frame 314 is the beginning of the new frame. The assigned sequence to the sub-frame 314 is 23 which is the last sequence number in the service class. The service algorithm accept to receive the next sequence number which is rolled back to service first assigned number, i.e., 20. The LS bit value in the last sub-frame 315 is set to 1 implying that the said sub-frame contains the last segment of the frame. The field labeled as C in the sub-frame 315 (FIG. 19) represents the original 2-bytes CRC of the transmitted frame. The 3-bytes trailing overhead (2-bytes sub-frame CRC & 1-byte for sub-framing) are removed from each of the sub-frames 314 & 315. The data portion d2' of the sub-frame 315 is annexed with data portion d1' of sub-frame 314 to construct the original transmitted frame. The CRC is calculated on the assembled frame and is compared with the original frame transmitted CRC value. If a successful match is found then this implies that the service algorithm assumption was true to "guess" sub-frame 314 as the



start of a new frame. On the other hand, if the CRC does not match then this means either sub-frame 314 was not the start of a new sub-frame as assumed or potentially the data in either sub-frames 314 or 315 had been corrupted. In both cases the assembled frame is discarded.”) paragraph 0124).

Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames wherein a frame buffer algorithm recognizes loss in expected sub-frame sequence and adjusts its execution accordingly as taught by Mustafa with an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a method for adapting screen updates based on network congestion, the method comprising: measuring network performance between a serving station and a served station, wherein the serving station provides screen data derived from an imaging system to the served station, and adjusting the screen data transmitted to the served station automatically based on the measurement of the network performance as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of remote medical image analysis.

Consider claim 16, and as applied to claim 15 above. Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein measuring

network performance comprises transmitting a test packet from the serving station and receiving a response packet from the served station ((“In this embodiment described above, a traffic value is determined using survey data. However, this invention is not limited to the above example, but it is possible that the OS/network driver 41 detects the number of times of collision of packets in the network apparatus 23, and the detected number of times of collision of packets is used as a traffic value. In which case, a table including the number of times of collision and the number of frames is prepared to determine the number of image transferring frames using this table.”) Tokunaga et al., column 16 lines 17-26).

Consider claim 17, and as applied to claim 15 above. Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method comprising converting image data from the imaging system into screen data ((“FIG. 11 is an image data communication system to which an image data communicating apparatus according to a second embodiment of this invention is applied. The image data communication system shown in FIG. 11 has an image transmitting side computer 21a as the image data communicating apparatus having a structure different from that according to the first embodiment described hereinbefore. Other parts of the structure remain the same as the image data communication system according to the first embodiment, detailed description of which are thus omitted.”) column 16 lines 28-37 (“The network receiving unit 43 of the image receiving side computer 22 examines, for example, the first octet of received data. If the received data is identified as image data, the image receiving unit

44 receives it, and the image displaying unit 45 displays it under its control on the image displaying unit 25 (Step T2).” Tokunaga et al., column 18 lines 14-19).

Consider claim 20, and as applied to claim 15 above. Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method comprising transmitting the screen data to the served station from the serving station (“A data receiving unit 12 serves for receiving the image data from another image data communicating apparatus 19 over the network 20. A data identifying unit identifies the type of data received by the data receiving unit 12.”) Tokunaga et al., column 4 lines 58-61).

8. Claims 31-32 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) and in further view of Aweya et al. (US 7047312 B1) and in further view of Mustafa (US 20020087716 A1).

Consider claim 31. Tokunaga et al. discloses a method for adapting screen updates based on network performance, the method comprising: detecting network performance between a serving station and a served station (“The transmitting unit 17 has a data transmitting unit 2, a traffic detecting unit 3 and a communication data quantity adjusting unit 4, whereas the receiving unit 18 has a data receiving unit 12, a data identifying unit 13, a display control unit 15 and a displaying unit 16.”) column 5 lines 63-67); comparing the network performance to a specified range (“If current traffic of the network apparatus 23 gets more crowded than an initial traffic of the network apparatus 23, the image data communicating apparatus implements image compression on the basis of a compression parameter, which was set based on a traffic

of the network, to transmit compressed image data, thereby controlling a transferable number of frames for the image data so as to bring the quantity of transmitted frames close to the initial number of frames.") column 22 lines 46-54); and modifying a plurality of screen updates dynamically based upon the comparison of the network performance ("The communication data quantity adjusting unit 4 sets a transmittable number of image transferring frames on the basis of the traffic detected by the traffic detecting unit 3 to automatically adjust the quantity of communication data in the data transmitting unit 2 on the basis of the set number of frames.") column 6 lines 5-10). However, Tokunaga et al. fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation ("In accordance with the principles of the present invention a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient

images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.") column 1 lines 43-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation as taught by Wood et al. with a method for adapting screen updates based on network performance, the method comprising: detecting network performance between a serving station and a served station,

comparing the network performance to a specified range, and modifying a plurality of screen updates dynamically based upon the comparison of the network performance as taught by Tokunaga et al. for the purpose of remote medical image analysis. However, Tokunaga et al., as modified by Wood et al., fails to disclose a method of comparing network performance to a specified range. Aweya et al. discloses a method of TCP rate control with adaptive thresholds wherein network traffic control is tested with a wide range of conditions (column 2 lines 12-26 and column 8 lines 38-51). Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a method of TCP rate control with adaptive thresholds wherein network traffic control is tested with a wide range of conditions as taught by Aweya et al. with an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a method for adapting screen updates based on network performance, the method comprising: detecting network performance between a serving station and a served station, comparing the network performance to a specified range, and modifying a plurality of screen updates dynamically based upon the comparison of the network performance as taught by Tokunaga et al., as modified by Wood et al., for the purpose of remote analysis. However, Tokunaga et al., as modified by Wood et al. and Aweya et al., fails to disclose an image system comprising a specified range of network behavior. Mustafa discloses a

system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames comprising a specified range ("FIG. 4A illustrates an example of creating multiple priority service classes and assigning each service class a specified range of sequence numbers") paragraph 0026).

Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames comprising a specified range as taught by Mustafa with method of TCP rate control with adaptive thresholds wherein network traffic control is tested with a wide range of conditions and an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a method for adapting screen updates based on network performance, the method comprising: detecting network performance between a serving station and a served station, comparing the network performance to a specified range, and modifying a plurality of screen updates dynamically based upon the comparison of the network performance as taught by Tokunaga et al., as modified by Wood et al. and Aweya et al., for the purpose of remote image analysis.

Regarding claim 32, and as applied to claim 31 above, Tokunaga et al., as modified by Wood et al., Aweya et al. and Mustafa, further discloses a system wherein

the window control mechanism of TCP is used to gauge network latency. This reads on the claimed "... network performance corresponds to the latency of a network ..." ("In a high-latency network environment, the window flow control mechanism of TCP may not be very effective because it relies on packet loss to signal congestion, instead of avoiding congestion and buffer overflow.") Aweya et al., column 1 lines 38-41).

Consider claim 40. Tokunaga et al., as modified by Aweya et al., discloses a system for adapting screen updates based on network performance, the system comprising: means for detecting network performance between a serving station and a served station ("The transmitting unit 17 has a data transmitting unit 2, a traffic detecting unit 3 and a communication data quantity adjusting unit 4, whereas the receiving unit 18 has a data receiving unit 12, a data identifying unit 13, a display control unit 15 and a displaying unit 16.") Tokunaga et al., column 5 lines 63-67); means for comparing the network performance to a specified range (Aweya et al., column 2 lines 12-26 and column 8 lines 38-51); and means for dynamically modifying a plurality of screen updates based upon the comparison of the network performance to the specified range ("If current traffic of the network apparatus 23 gets more crowded than an initial traffic of the network apparatus 23, the image data communicating apparatus implements image compression on the basis of a compression parameter, which was set based on a traffic of the network, to transmit compressed image data, thereby controlling a transferable number of frames for the image data so as to bring the quantity of transmitted frames close to the initial number of frames.") Tokunaga et al., column 22 lines 46-54 ("The communication data quantity adjusting unit 4 sets a



transmittable number of image transferring frames on the basis of the traffic detected by the traffic detecting unit 3 to automatically adjust the quantity of communication data in the data transmitting unit 2 on the basis of the set number of frames.") Tokunaga et al., column 6 lines 5-10). However, Tokunaga et al., as modified by Aweya et al., fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation ((("In accordance with the principles of the present invention a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging

system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.”) column 1 lines 43-67). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation as taught by Wood et al. with a system for adapting screen updates based on network performance, the system comprising: means for detecting network performance between a serving station and a served station, means for comparing the network performance to a specified range, and means for dynamically modifying a plurality of screen updates based upon the comparison of the network performance to the specified range as taught by Tokunaga et al., as modified by Aweya et al., for the purpose of remote medical analysis. However, Tokunaga et al., as modified by Wood et

al. and Aweya et al., fails to disclose an image system comprising a specified range of network behavior. Mustafa discloses a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames comprising a specified range ("FIG. 4A illustrates an example of creating multiple priority service classes and assigning each service class a specified range of sequence numbers") paragraph 0026).

Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames comprising a specified range as taught by Mustafa with an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a system for adapting screen updates based on network performance, the system comprising: means for detecting network performance between a serving station and a served station, means for comparing the network performance to a specified range, and means for dynamically modifying a plurality of screen updates based upon the comparison of the network performance to the specified range as taught by Tokunaga et al., as modified by Wood et al. and Aweya et al., for the purpose of remote image analysis.

9. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) and in further view of Mustafa (US 20020087716 A1).

Consider claim 41. Tokunaga et al. discloses a system for adapting screen updates based on network congestion, the system comprising: means for measuring network performance between a serving station and a served station ("The transmitting unit 17 has a data transmitting unit 2, a traffic detecting unit 3 and a communication data quantity adjusting unit 4, whereas the receiving unit 18 has a data receiving unit 12, a data identifying unit 13, a display control unit 15 and a displaying unit 16.") column 5 lines 63-67), wherein the serving station provides screen data derived from an imaging system to the served station ("The data transmitting unit 2 of the transmitting unit 17 transmits image data to another image data communicating unit 19. The traffic detecting unit 3 detects the traffic of the network 20.") column 6 lines 1-4); and means for automatically adjusting the screen data transmitted to the served station based on the measurement of the network performance ("The communication data quantity adjusting unit 4 sets a transmittable number of image transferring frames on the basis of the traffic detected by the traffic detecting unit 3 to automatically adjust the quantity of communication data in the data transmitting unit 2 on the basis of the set number of frames.") column 6 lines 5-10). However, Tokunaga et al. fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive

image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation ((“In accordance with the principles of the present invention a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and

features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.”) column 1 lines 43-67). Wood et al. further discloses a central server with a local display and keyboard (Figure 15, items 242 and 234). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation as taught by Wood et al. with a system for adapting screen updates based on network congestion, the system comprising: means for measuring network performance between a serving station and a served station, wherein the serving station provides screen data derived from an imaging system to the served station, and means for automatically adjusting the screen data transmitted to the served station based on the measurement of the network performance as taught by Tokunaga et al. for the purpose of remote medical analysis. However, Tokunaga et al., as modified by Wood et al., fails to disclose a method of remote image analysis comprising a method of adjusting a frame buffer scanning algorithm. Mustafa discloses a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames wherein a frame buffer algorithm recognizes loss in expected sub-frame sequence and adjusts its execution accordingly (“Returning to step 293, if there is already a sub-frame in the holding buffer then the algorithm

proceeds to step 296. In this step 296 the algorithm reads the 7-bit sequence number of the previous received sub-frame in the service holding buffer. If there is no sub-frame loss then it is expected that the present sub-frame sequence number is the next logical sequence number then the previous stored sub-frame . The decision box 297 determines this condition. If the present sub-frame sequence number is incremented from the previous sub-frame then the algorithm proceeds to step 300 where it strips off all the header information and the last three bytes (2-bytes CRC and 1 sub-framing byte). It stores the sub-framing byte information to be used for the sequence comparison with the next sub-frame. Only the data portion is appended with the previous sub-frame data as shown in conjunction with FIG. 8. In step 301 the status of the LS bit is determined. If the present sub-frame has LS bit set to 1 it indicates that the present sub-frame contains the last segment of a frame and it has completed all the segments of the received frame. If so, the algorithm moves to step 302 and then to step 303.) paragraph 0121 ("As shown in the FIG. 19A, the sub-frame 313 is either lost during the transmission or has been received as an invalid sub-frame. In both cases no useful information about the d3 portion contained in the sub-frame 313 can be extracted and the sub-frame 313 is dropped. The service algorithm recognizes this loss of the sub-frame in step 297 as illustrated in FIG. 18. Since the essential segment of the original frame had been lost the remaining two sub-frames 311 and 312 can not reproduce the information as transmitted in the frame. As a result, the service algorithm proceeds to discard all the sub-frames in the buffer (sub-frames 311 and 312). This action corresponds to step 298 of the service algorithm in FIG. 18. After discarding the

data it proceeds with the assumption that the sub-frame 314 is the beginning of the new frame. The assigned sequence to the sub-frame 314 is 23 which is the last sequence number in the service class. The service algorithm accept to receive the next sequence number which is rolled back to service first assigned number, i.e., 20. The LS bit value in the last sub-frame 315 is set to 1 implying that the said sub-frame contains the last segment of the frame. The field labeled as C in the sub-frame 315 (FIG. 19) represents the original 2-bytes CRC of the transmitted frame. The 3-bytes trailing overhead (2-bytes sub-frame CRC & 1-byte for sub-framing) are removed from each of the sub-frames 314 & 315. The data portion d2' of the sub-frame 315 is annexed with data portion d1' of sub-frame 314 to construct the original transmitted frame. The CRC is calculated on the assembled frame and is compared with the original frame transmitted CRC value. If a successful match is found then this implies that the service algorithm assumption was true to "guess" sub-frame 314 as the start of a new frame. On the other hand, if the CRC does not match then this means either sub-frame 314 was not the start of a new sub-frame as assumed or potentially the data in either sub-frames 314 or 315 had been corrupted. In both cases the assembled frame is discarded.") paragraph 0124).

Therefore, it would have been obvious for a person of ordinary skill in the art at the time the invention was made to incorporate a system and method for transmitting customized multi priority services on a single or multiple links over data link layer frames wherein a frame buffer algorithm recognizes loss in expected sub-frame sequence and adjusts its execution accordingly as taught by Mustafa with an ultrasonic diagnostic



imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation and a system for adapting screen updates based on network congestion, the system comprising: means for measuring network performance between a serving station and a served station, wherein the serving station provides screen data derived from an imaging system to the served station, and means for automatically adjusting the screen data transmitted to the served station based on the measurement of the network performance as taught by Tokunaga et al., as modified by Wood et al., for the purpose of remote medical image analysis.

**10.** Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040005094 A1) in view of Wiklof et al. (US 20050023356 A1) in further view of Machida (US 6642943 B1) and in further view of Wood et al. (US 5851186 A).

Regarding claim 42. Huffman, as modified by Wiklof et al., discloses a medical imaging system wherein an imaging system detects a plurality of signals that are convertible into an image; an imaging system produces image data; a server receives image data, a coefficient block scans pixel coordinates of the image data; and a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network. This reads on the claimed "A remote viewing system for a medical imaging system, comprising: an imaging system configured to detect a plurality of signals that are convertible into an image, the system configured to

produce image data; a serving station configured to receive the image data, the serving station comprising: a scanner module configured to modify a scanning rate of the image data; and an encoder module configured to modify an encoding format of the image data; a served station configured to receive modified image data from the serving station via a network; ..." ("A technique for distributing large images over a network, such as medical images, has been developed by Dr. Paul Chang, M.D., and Carlos Bentancourt at the University of Pittsburgh. This technique, referred to as dynamic transfer syntax, operates in a client-server environment to deliver, from the server to the client, image data as the image data is needed at the client (i.e., a just in time data delivery mechanism). To implement this "just in time" data delivery mechanism, the dynamic transfer syntax generates a flexible hierarchical representation of an image for storage at the server. The hierarchical representation consists of coefficients produced by a wavelet transform. To view portions of the image at the client, the client issues requests for data that include coefficient coordinates to identify coefficients in the hierarchical representation.") Huffman, paragraph 0006 ("In response to the client request, the server extracts transform data defined by the request.") Huffman, paragraph 0008 ("In one embodiment for image distribution, client application 460 generates a set of pixel coordinates to identify a portion of the source image 110 at a specified resolution. In turn, coefficient block request processing 420 maps the pixel coordinates at a specified resolution to coefficient coordinates.") Huffman, paragraph 0048 ("In general, the compression engine 140 compresses, using a lossless encoder technique, the pyramidal data representation(s) 130.") Huffman, paragraph 0020 ("The

server transfers the compressed data to the client. The client decompresses the compressed data to obtain quantized data, and de-quantizes the quantized data to recover the transform data.") Huffman, paragraph 0008). However, Huffman, as modified by Wiklof et al., fails to teach a plurality of network sensors for detecting network congestion. Machida discloses a system wherein network traffic is monitored and image data going across a network is adjusted accordingly. This reads on the claimed "... a plurality of network sensors in communication with the serving station and configured to provide network performance data to the serving station, wherein the serving station dynamically modifies at least one of the scanning rate and the encoding format based on the network performance data." ("Resolution which is adjusted by a slider 410 is automatically set in 1/2 of the highest resolution of the selected output device side, in consideration of traffic of the image data managed on the network. Further, it is assumed that the resolution which is identical or close to the automatically set resolution is automatically set as the resolution of the input device side.") column 15 lines 36-42 ("... the network traffic quantity is always monitored by the management server.") column 37 lines 28-29). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a network sensing apparatus as taught by Machida with a medical imaging system as taught by Huffman for the purpose of sending medical image data across a network according to available network bandwidth. However, Huffman, as modified by Wiklof et al. and Machida, fails to disclose a method for adapting screen updates based on network congestion linking a serving station to a served station via a network, the serving station

being coupled to a medical diagnostic imaging system for controlling the imaging system and being configured to receive image data, the served station enabling a remote operator to interact with the serving station, the served station being configured to receive modified image data from the serving station via a network. Wood et al. discloses an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation ((“In accordance with the principles of the present invention a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation. These capabilities may surprisingly be provided by commercially available software features and inexpensive personal computer hardware, making the capabilities easy to afford and use. Embodiments of the present invention describe techniques for modifying an ultrasonic diagnostic imaging system with inexpensive and readily available hardware and software, enabling the diagnostic information gathered through use of the ultrasound system to be accessed from remote locations. Constructed embodiments of the present invention are described which provide means for remotely accessing configuration information from the ultrasound system, running tests and diagnostics on the ultrasound system from remote locations, and even the ability to remotely control

the operation of the ultrasound system. Embodiments of the present invention can also provide many of the functions and features of commercially available ultrasound image management systems, but for only a tiny fraction of the cost of a typical image management system.”) column 1 lines 43-67).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate an ultrasonic diagnostic imaging system with universal access to diagnostic information and images a medical diagnostic ultrasonic imaging system is provided which can be remotely accessed, interrogated or controlled from virtually any place on the globe to provide information about its operating characteristics, patient images and reports, or even for remotely controlled system operation as taught by Wood et al. with a medical imaging system wherein an imaging system detects a plurality of signals that are convertible into an image; an imaging system produces image data; a server receives image data, a coefficient block scans pixel coordinates of the image data; and a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network, wherein network traffic is monitored and image data going across a network is adjusted accordingly as taught by Huffman, as modified by Wiklof et al. and Machida, for the purpose of remote medical image analysis.

Regarding claim 46, and as applied to claim 42 above, Huffman, as modified by Wiklof et al. and Wood et al., discloses a remote medical imaging system comprising a network. This reads on the claimed “The remote viewing system of claim 42, wherein the network ...” (“A compression technique, for use in a network environment,

compresses transform data to improve transmission rates in low bandwidth applications. In one embodiment, the source data comprises source images, such as medical images.") Huffman, paragraph 0008). However, Huffman, as modified by Wiklof et al. and Wood et al., fails to teach a system comprising a wide area network. Machida discloses a system wherein two LANs are connected to form a WAN. This reads on the claimed "... the network comprises a wide area network." ("Basically, the WAN is composed of the plural LAN's which are connected together through a high-speed digital line such as ISDN (Integrated Services Digital Network). For example, as shown in FIG. 1, when the LAN 100 and the LAN 120 are connected with each other through a backbone 140, the WAN is established.") column 5 lines 1-6).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a wide area network as taught by Machida with a remote medical imaging system network as taught by Huffman, as modified by Wiklof et al. and Wood et al., for the purpose of large scale distribution of medical imaging data.

Regarding claim 48, and as applied to claim 42 above, Huffman, as modified by Machida and Wood et al., discloses a remote viewing system for a medical imaging system that provides screen data to a served station; and configured to provide network performance data to the serving station. This reads on the claimed "The remote viewing system of claim 42, wherein the serving station ... transmit ... image data ...". However, Huffman, as modified by Machida and Wood et al., fails to teach using a framebuffer to manipulate a displayed image. Wiklof et al. discloses a system that modifies a

framebuffer to adjust displayed images. This reads on the claimed "... the serving station utilizes a remote framebuffer protocol to transmit the modified image data in the served station." ("FIG. 2 is a block diagram that illustrates one control approach for adjusting variable illuminator intensity. Initially, a drive circuit drives the light source based upon a pattern, which may be embodied as digital data values in a frame buffer 202. The frame buffer 202 drives variable illuminator 109, which may, for instance comprise an illuminator and scanner as in FIG. 1. For each spot or region, the amount of scattered light is detected and converted into an electrical signal by detector 116. Detector 116 may include an A/D converter that outputs the electrical signal as a binary value, for instance. One may refer to this detected value as a residual. The residual is inverted by inverter 208, and is optionally processed by optional intra-frame image processor 210. The inverted residual or processed value is then added to the corresponding value in the frame buffer 202 by adder 212. This proceeds through the entire frame or FOV until all spots have been scanned and their corresponding frame buffer values modified. The process is then repeated for a second frame, a third frame, etc. until all spot residuals have converged. In some embodiments and particularly those represented by FIG. 4a, the pattern in the frame buffer represents the inverse of the real-world image in the FOV at this point, akin to the way a photographic negative represents the inverse of its corresponding real-world image.") paragraph 0077).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate manipulating framebuffers to adjust a displayed image as taught by Wiklof et al. with a remote medical imaging system as

taught by Tokunaga et al., as modified by Machida and Wood et al., for the purpose of adjusting a remotely displayed medical displayed image.

Regarding claim 49, and as applied to claim 42 above. Huffman, as modified by Wiklof et al., Machida and Wood et al., discloses a remote medical imaging system wherein a served station transmits remote input data to a serving station ("To view portions of the image at the client, the client issues requests for data that include coefficient coordinates to identify coefficients in the hierarchical representation.") Huffman, paragraph 0006).

11. Claims 3-5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040005094 A1) as modified by Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) in further view of Wiklof et al. (US 20050023356 A1) and in further view of Grace et al. (US 7143159 B1).

Regarding claim 3, and as applied to claim 2 above, Huffman, as modified by Wood et al. and Wiklof et al., discloses a system wherein a serving station serves an image to a client. This reads on the claimed "The remote viewing system of claim 2, ... the serving station ..." ("In a client-server embodiment, a client issues to a server a request for at least a portion of the source data. The request defines a block of the coefficients and at least one quantization value. In response to the client request, the server extracts transform data defined by the request. The transform data is quantized, in accordance with the quantization value, and is compressed to generate compressed data. The server transfers the compressed data to the client.") Huffman, paragraph



0008). However, Huffman, as modified by Wood et al. and Wiklof et al., fails to teach a system wherein the serving station comprises its own display. Machida discloses a system wherein a management server comprises a display apparatus. This reads on the claimed "The remote viewing system of claim 2, wherein the serving station is configured to present an indication ..." ("... information is displayed on a display apparatus of the PC or the management server of the demand sender.") column 21 lines 2-4). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a management server comprising a display apparatus as taught by Machida with an image serving station as taught by Huffman, as modified by Wood et al. and Wiklof et al., for the purpose of local administration of a server. However, Huffman, as modified by Wood et al., Wiklof et al. and Machida, fails to teach a serving station comprising a display that shows network performance data. Grace et al. discloses a system wherein network performance data is output to a screen. This reads on the claimed "... the serving station is configured to present an indication associated with the network performance data to the operator." ("The present inventors have also realized that an effective method for presenting Network management data is via a split window display. The split window display includes two windows, each with scrolling capability, selection buttons for varying a view presented in the windows, and a search utility to pinpoint user specified data instances in the network management data. The split window display presents high level network data in a first window using an expandable/collapsible tree format.") column 6 lines 42-50).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate displayed network performance data as taught by Grace et al. with a serving station comprising a display as taught by Huffman, as modified by Wood et al., Wiklof et al. and Machida, for the purpose of monitoring network performance.

Regarding claim 4, and as applied to claim 3 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein a management server comprises a display apparatus. This reads on the claimed "The remote viewing system of claim 3, ... the indication ..." ("... information is displayed on a display apparatus of the PC or the management server of the demand sender.") Machida, column 21 lines 2-4). However, Huffman, as modified by Wood et al., Wiklof et al. and Machida, fails to teach a serving station comprising a display that shows network performance data. Grace et al. discloses a system wherein network performance data is output to a screen. This reads on the claimed "The remote viewing system of claim 3, wherein the indication comprises a bar chart." ("In this example, network protocol ip 1030 is selected, and display side 750 includes network traffic statistics (bytes per second) for each of the children application protocols (www-http 1040, smb 1042, and nbt\_data 1044). In this embodiment, the network traffic statistics are shown as a bar graph indicating the number of bytes per second, ...) column 19 lines 53-59).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate displayed network performance data as taught by Grace et al. with a serving station comprising a display as taught by Huffman,

as modified by Wood et al., Wiklof et al. and Machida, for the purpose of monitoring network performance in a specific format.

Regarding claim 5, and as applied to claim 3 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein a management server comprises a display apparatus. This reads on the claimed "The remote viewing system of claim 3, .. the indication ..." ("... information is displayed on a display apparatus of the PC or the management server of the demand sender.") Machida, column 21 lines 2-4). However, Huffman, as modified by Wood et al., Wiklof et al. and Machida, fails to teach a serving station comprising a display that shows network performance data. Grace et al. discloses a system wherein network performance data is output to a screen. This reads on the claimed "The remote viewing system of claim 3, wherein the indication comprises a network indicator that relates to the network performance data." ("The present invention gathers data describing the network traffic using RMON standard and RMON extension MIBs and correlates the data to determine useful statistics about the traffic (application originating the traffic, protocols utilized, etc.), and provide a useful display of the traffic and protocols.") column 6 lines 35-41).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate displayed network performance data as taught by Grace et al. with a serving station comprising a display as taught by Huffman, as modified by Wood et al., Wiklof et al. and Machida, for the purpose of monitoring network performance.

Regarding claim 10, and as applied to claim 1 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein local area networks are connected to form wide area networks. This reads on the claimed "The remote viewing system of claim 1, wherein the network ...". However, Huffman, as modified by Wood et al., Wiklof et al. and Machida, fails to teach of a connection to the internet. Grace et al. discloses a system wherein a wide area network comprises an internet connection. This reads on the claimed "... the network comprises an Internet." ("Local area networks (LANs) are arrangements of various hardware and software elements that operate together to allow a number of digital devices to exchange data within the LAN and also may include internet connections to external wide area networks (WANs).") column 2 lines 36-40).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate a wide area network comprising an internet connection as taught by Grace et al. with wide area networking as taught by Huffman, as modified by Wood et al., Wiklof et al. and Machida, for the purpose of internet access.

**12.** Claims 7-8 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040005094 A1) as modified by Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) in further view of Wiklof et al. (US 20050023356 A1) and in further view of Aweya et al. (US 7047312 B1).

Regarding claim 7, and as applied to claim 1 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein sensors determine network traffic and adjust image data flow accordingly. This reads on the claimed "The remote viewing system of claim 1, wherein the plurality of network sensors ...". However, Huffman, as modified by Wood et al., Wiklof et al. and Machida, fails to teach the network sensors using packet information for gauging network congestion. Aweya et al. discloses exchanging TCP packet information as a network test. This reads on the claimed "The remote viewing system of claim 1, wherein the plurality of network sensors exchange a plurality of packets to determine network congestion." ("The network device's window size represents the maximum number of packets that a TCP connection can have in transit (i.e., unacknowledged by a receiver) at a time. In determining the network device's window size per connection, one embodiment of the TCP rate control scheme tries to match the sum of the windows of all the active TCP connections sharing the network node to the network bandwidth-delay product plus the available buffering space, thus avoiding packet losses whenever possible. The method takes its decision of modifying the receiver's advertised window of an incoming ACK packet so that the queue occupancy level is kept at a given target level, thereby eliminating buffer underflow and overflow as much as possible.") column 6 lines 17-29).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate exchanging TCP packet information as taught by Aweya et al. with network traffic sensors as taught by Huffman, as modified by

Wood et al., Wiklof et al. and Machida, for the purpose of network analysis for optimal performance of a network.

Regarding claim 8, and as applied to claim 1 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a system wherein sensors determine network traffic and adjust image data flow accordingly. This reads on the claimed "The remote viewing system of claim 1, wherein the plurality of network sensors ...". However, Huffman, as modified Wood et al. and Machida, fails to teach using TCP packets to test network latency. Aweya et al. discloses a system wherein the window control mechanism of TCP is used to gauge network latency. This reads on the claimed "The remote viewing system of claim 1, wherein the plurality of network sensors exchange a plurality of packets to determine network latency." ("In a high-latency network environment, the window flow control mechanism of TCP may not be very effective because it relies on packet loss to signal congestion, instead of avoiding congestion and buffer overflow.") column 1 lines 38-41).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate latency testing of networks as taught by Aweya et al. with a network wherein the amount of transmitted data is adjusted to correspond with current network traffic conditions as taught by Huffman, as modified by Wood et al., Wiklof et al. and Machida, for the purpose of network analysis for optimal performance of a network.

Regarding claim 47, and as applied to claim 42 above, Huffman, as modified by Wood et al., Wiklof et al. and Machida, discloses a remote medical imaging system wherein sensors determine network traffic and adjust image data flow accordingly. This reads on the claimed "The remote viewing system of claim 42, wherein the plurality of network sensors ... determine network latency.". However, Huffman, as modified Wood et al., Wiklof et al. and Machida, fails to teach using TCP packets to test network latency. Aweya et al. discloses a system wherein the window control mechanism of TCP is used to gauge network latency. This reads on the claimed "... the plurality of network sensors exchange a plurality of packets to determine network latency." ("In a high-latency network environment, the window flow control mechanism of TCP may not be very effective because it relies on packet loss to signal congestion, instead of avoiding congestion and buffer overflow.") column 1 lines 38-41).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate latency testing of networks as taught by Aweya et al. with a network wherein the amount of transmitted data is adjusted to correspond with current network traffic conditions as taught by Huffman, as modified by Wood et al., Wiklof et al. and Machida, for the purpose of network analysis for optimal performance of a medical image network.

**13.** Claim 18 is rejected under 35 U.S.C. 103(a) as being obvious over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) in further view of Benejam et al. (US 7133915 B2) and in further view of Kelley et al. (US 20020082864 A1).

Regarding claim 18, and as applied to claim 15 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein an imaging system provides screen data to a served station. This reads on the claimed "The method of claim 15, wherein the imaging system ..." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to teach a method of computer tomography. Kelley et al. discloses a method wherein an imaging system comprises a computed tomography imaging system, an magnetic resonance imaging system, a tomosynthesis system, a positron emission tomography imaging system, and a X-ray imaging system. This reads on the claimed "... the imaging system comprises one of a computed tomography imaging system, an magnetic resonance imaging system, a tomosynthesis system, a positron emission tomography imaging system, and a X-ray imaging system." ("Currently, a number of modalities exist for medical diagnostic and imaging systems. These include computed tomography (CT) systems, x-ray systems (including both conventional and digital or digitized imaging systems), magnetic resonance (MR) systems, positron emission tomography (PET) systems, ultrasound systems, nuclear medicine systems, and so forth. In many instances, these modalities complement one another and offer the physician a range of techniques for imaging particular types of tissue, organs, physiological systems, and so forth. Health care institutions often



dispose of several such imaging systems at a single or multiple facilities, permitting its physicians to draw upon such resources as required by particular patient needs.") paragraph 0004).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate magnetic resonance tomography (MRT) as taught by Kelley et al. with an imaging system as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of rendering images of the inside of an object.

**14.** Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) in further view of Benejam et al. (US 7133915 B2) and in further view of Wiklof et al. (US 20050023356 A1).

Regarding claim 33, and as applied to claim 31 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein an imaging system provides screen data to a served station and adjusts the quantity to suit the current network level of performance. This reads on the claimed "The method of claim 31, wherein dynamically modifying the plurality of screen updates ... based on the network performance." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12).

However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to teach using a framebuffer to manipulate a displayed image. Wiklof et al. discloses a system that modifies a framebuffer to adjust displayed images. This reads on the claimed "... dynamically modifying the plurality of screen updates comprises adjusting a frame buffer scanning algorithm based on the network performance." ("FIG. 2 is a block diagram that illustrates one control approach for adjusting variable illuminator intensity. Initially, a drive circuit drives the light source based upon a pattern, which may be embodied as digital data values in a frame buffer 202. The frame buffer 202 drives variable illuminator 109, which may, for instance comprise an illuminator and scanner as in FIG. 1. For each spot or region, the amount of scattered light is detected and converted into an electrical signal by detector 116. Detector 116 may include an A/D converter that outputs the electrical signal as a binary value, for instance. One may refer to this detected value as a residual. The residual is inverted by inverter 208, and is optionally processed by optional intra-frame image processor 210. The inverted residual or processed value is then added to the corresponding value in the frame buffer 202 by adder 212. This proceeds through the entire frame or FOV until all spots have been scanned and their corresponding frame buffer values modified. The process is then repeated for a second frame, a third frame, etc. until all spot residuals have converged. In some embodiments and particularly those represented by FIG. 4a, the pattern in the frame buffer represents the inverse of the real-world image in the FOV at this point, akin to the way a photographic negative represents the inverse of its corresponding real-world image.") paragraph 0077).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate manipulating framebuffers to adjust a displayed image as taught by Wiklof et al. with an imaging system as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of adjusting a displayed image.

**15.** Claims 21, 34 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) in further view of Benejam et al. (US 7133915 B2) and in further view of Ueda (US 20020018587 A1).

Regarding claim 21, and as applied to claim 15 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein an imaging system provides screen data to a served station. This reads on the claimed "The method of claim 15, comprising ... screen data ... transmission to the server station." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to teach a method of encoding an image. Ueda discloses encoding an image signal into a digitized image signal. This reads on the claimed "... encoding the screen data for transmission to the server station." ("In addition, the image distribution apparatus preferably comprises a data rate memory unit which prestores plural sets of data rate groups consisted of one

or more of the data rates, and data rate setting means for setting the data rate of the digitized image signal by selecting from the plural stored sets of the data rate groups, and wherein the image encoding unit encodes the image signal to the digitized image signal at all the rates included in the selected data rate group. In such a manner, the data rate of a digitized image signal generated by the encoding unit can be easily changed to a suitable value.") paragraph 0015).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate encoding image signals as taught by Ueda with sending an image to a screen as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of scalable image compression.

Regarding claim 34, and as applied to claim 31 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein an imaging system provides dynamically modified screen data to a served station. This reads on the claimed "The method of claim 31, wherein dynamically modifying the plurality of screen updates ... based on the network performance." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to teach a method of encoding an image. Ueda discloses encoding an image signal into a digitized image signal. This reads on the claimed "... dynamically modifying the plurality of screen updates comprises adjusting an encoding

algorithm based on the network performance.” (“In addition, the image distribution apparatus preferably comprises a data rate memory unit which prestores plural sets of data rate groups consisted of one or more of the data rates, and data rate setting means for setting the data rate of the digitized image signal by selecting from the plural stored sets of the data rate groups, and wherein the image encoding unit encodes the image signal to the digitized image signal at all the rates included in the selected data rate group. In such a manner, the data rate of a digitized image signal generated by the encoding unit can be easily changed to a suitable value.”) paragraph 0015).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate encoding image signals as taught by Ueda with adjusting the rate at which an image is sent to a screen depending on current network performance as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of scalable image compression.

Regarding claim 35, and as applied to claim 31 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a method wherein an imaging system provides dynamically modified screen data to a served station. This reads on the claimed “The method of claim 31, comprising ... the plurality of screen updates for transmission to the served station.” (“The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.”) Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al. and Benejam et al.,

fails to teach a method of encoding an image. Ueda discloses encoding an image signal into a digitized image signal. This reads on the claimed "... encoding the plurality of screen updates for transmission to the served station." ("In addition, the image distribution apparatus preferably comprises a data rate memory unit which prestores plural sets of data rate groups consisted of one or more of the data rates, and data rate setting means for setting the data rate of the digitized image signal by selecting from the plural stored sets of the data rate groups, and wherein the image encoding unit encodes the image signal to the digitized image signal at all the rates included in the selected data rate group. In such a manner, the data rate of a digitized image signal generated by the encoding unit can be easily changed to a suitable value.") paragraph 0015).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate encoding screen updates as taught by Ueda with adjusting the quantity of data transmitted across a network depending on the current bandwidth as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of optimal network performance and data integrity.

**16.** Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) in further view of Benejam et al. (US 7133915 B2) in further view of Ueda (20020018587 A1) and in further view of Swami (US 20040165538 A1).

Regarding claim 22, and as applied to claim 15 above, Tokunaga et al., as modified by Wood et al., Benejam et al. and Ueda, discloses a method wherein an

imaging system provides screen data to a served station. This reads on the claimed "The method of claim 21, wherein adjusting comprises modifying a data transmission algorithm that compresses the screen data based on the network performance." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al., Benejam et al. and Ueda, fails to teach a method comprising a data transmission algorithm. Swami discloses a method wherein a data transmission algorithm is used to ascertain network bandwidth. This reads on the claimed "The method of claim 21, wherein adjusting comprises modifying a data transmission algorithm that compresses the screen data based on the network performance." ("The SS\_THRESH is a threshold value used to determine whether the slow start or congestion avoidance algorithm should be used to control data transmission. When segments are first introduced into the network, the conditions are unknown, and the transport layer may slowly probe the network to ascertain the available capacity for the particular path. This is performed to minimize the chances of causing congestion in the network.") paragraph 0065).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate use of data transmission algorithms as taught by Swami with an imaging system as taught by Tokunaga et al., as modified by

Wood et al., Benejam et al. and Ueda, for the purpose of efficiently moving data across a network.

17. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tokunaga et al. (US 5968132 A) in view of Wood et al. (US 5851186 A) in further view of Benejam et al. (US 7133915 B2) and in further view of Machida (US 6642943 B1).

Regarding claim 23, and as applied to claim 15 above, Tokunaga et al., as modified by Wood et al. and Benejam et al., discloses a computer program product that, when executed, an imaging system provides screen data to a served station. This reads on the claimed "The method of claim 15, ... displaying ... at one of the serving station ..." ("The present invention relates to an image data communicating apparatus and a communication data quantity adjusting method used in an image data communication system suitable for used when image data such as video images or the like is transferred in a network environment.") Tokunaga et al., column 1 lines 8-12). However, Tokunaga et al., as modified by Wood et al. and Benejam et al., fails to teach a method of displaying network traffic or congestion. Machida discloses a method wherein network traffic quantity information is acquired and displayed. This reads on the claimed "... displaying an indication of the network performance at one of the serving station and the served station based on the measurement of the network performance." ("Conversely, if judged in the step S809 that the network traffic quantity display is instructed, the flow advances to a step S810 to acquire network traffic quantity information (not shown) from the management server, and the flow further advances to a step S811 to display the acquired information in the user's desired form (list display,



graph display or the like). It should be noted that this display form is indicated when the network traffic quantity display is instructed.") column 37 lines 9-17).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate displaying network traffic as taught by Machida with displaying an image as taught by Tokunaga et al., as modified by Wood et al. and Benejam et al., for the purpose of monitoring the health of a network.

18. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040054667 A1) as modified by Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) in further view of Wiklof et al. (US 20050023356 A1) and in further view of Kelley et al. (US 20020082864 A1).

Regarding claim 43, and as applied to claim 42 above. Huffman, as modified by Wood et al., Machida and Wiklof et al., discloses a medical imaging system wherein an imaging system detects a plurality of signals that are convertible into an image; an imaging system produces image data; a server receives image data, a coefficient block scans pixel coordinates of the image data; a compression engine to modify an encoding format of the image data, a client receiving image data from the server via a network, and a plurality of network sensors for detecting network congestion. This reads on the claimed "The remote viewing system of claim 42, ... the medical imaging system ...".

However, Huffman, as modified by Wood et al., Machida and Wiklof et al., fails to teach a medical imaging system comprising computed tomography imaging, magnetic resonance imaging, tomosynthesis, positron emission tomography imaging, or X-ray

imaging. Kelley et al. discloses a method wherein an imaging system comprises a computed tomography imaging system, an magnetic resonance imaging system, a tomosynthesis system, a positron emission tomography imaging system, and a X-ray imaging system. This reads on the claimed "... the imaging system comprises one of a computed tomography imaging system, an magnetic resonance imaging system, a tomosynthesis system, a positron emission tomography imaging system, and a X-ray imaging system." ("Currently, a number of modalities exist for medical diagnostic and imaging systems. These include computed tomography (CT) systems, x-ray systems (including both conventional and digital or digitized imaging systems), magnetic resonance (MR) systems, positron emission tomography (PET) systems, ultrasound systems, nuclear medicine systems, and so forth. In many instances, these modalities complement one another and offer the physician a range of techniques for imaging particular types of tissue, organs, physiological systems, and so forth. Health care institutions often dispose of several such imaging systems at a single or multiple facilities, permitting its physicians to draw upon such resources as required by particular patient needs.") paragraph 0004).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate magnetic resonance tomography (MRT) as taught by Kelley et al. with a medical imaging system that transmits imaging data across a network depending on the current performance of said network as taught by

Huffman, as modified by Wood et al., Machida and Wiklof et al., for the purpose of rendering medical images of the inside of an object across a network.

**19.** Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040054667 A1) as modified by Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) in further view of Wiklof et al. (US 20050023356 A1) and in further view of Kake et al. (US 20040054667 A1).

Regarding claim 44, and as applied to claim 42 above, Huffman, as modified by Machida, Wood et al. and Wiklof et al., discloses a remote viewing system for a medical imaging system that provides screen data to a served station; and network traffic quantity information is acquired and displayed. This reads on the claimed "The remote viewing system of claim 42, wherein the serving station is configured to present ...". However, Huffman, as modified by Machida, Wood et al. and Wiklof et al., fails to disclose network traffic displayed on a remote viewing system. Kake et al. discloses a client terminal apparatus that displays the present congestion status of a network. This reads on the claimed "The remote viewing system ... is configured to present an indication associated with the network performance data to an operator." ("The present invention may be applied to a client terminal apparatus provided with a network linking function, which allows access to Web sites on a network such as, for example, the Internet. With the client terminal apparatus according to embodiments of this present invention, present congestion status of the network and update status of, for example, Web sites saved by a "bookmarking function", Web sites searched by a "search

function" or Web sites saved as "History" of Web sites the user has accessed in the past and the like, may be confirmed.") paragraph 0036).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate displaying network traffic on a client as taught by Kake et al. with displaying an image on a server as taught by Huffman, as modified by Machida, Wood et al. and Wiklof et al., for the purpose of monitoring the health of a network from remote locations in a medical imaging environment.

**20.** Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huffman (US 20040054667 A1) as modified by Machida (US 6642943 B1) in further view of Wood et al. (US 5851186 A) in further view of Wiklof et al. (US 20050023356 A1) and in further view of Tokunaga et al. (US 5968132 A).

Regarding claim 45, and as applied to claim 42 above, Huffman, as modified by Machida, Wood et al. and Wiklof et al., discloses a remote viewing system for a medical imaging system that provides screen data to a served station; and a plurality of network sensors in communication with the serving station and configured to provide network performance data to the serving station. This reads on the claimed "The remote viewing system of claim 42, wherein the plurality of network sensors ... determine network performance.". However, Huffman, as modified by Machida, Wood et al. and Wiklof et al., fails to disclose a method of using TCP packets to determine network bandwidth. Tokunaga et al. discloses a method of determining a network traffic value by the number of collisions that a sent packet encounters. This reads on the claimed "...

network sensors exchange a plurality of packets to determine network performance.” (“In this embodiment described above, a traffic value is determined using survey data. However, this invention is not limited to the above example, but it is possible that the OS/network driver 41 detects the number of times of collision of packets in the network apparatus 23, and the detected number of times of collision of packets is used as a traffic value. In which case, a table including the number of times of collision and the number of frames is prepared to determine the number of image transferring frames using this table.”) column 16 lines 17-26).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate using TCP packets to determine network traffic as taught by Tokunaga et al. with displaying a medical image on a remote server as taught by Huffman, as modified by Machida, Wood et al. and Wiklof et al., for the purpose of efficiently using a network to transmit data intensive medical images.

### ***Response to Arguments***

21. Applicant's arguments of 07 July 2008 with respect to claims 15, 31 and 40-41 have been considered but are moot in view of the new ground(s) of rejection.

In response to Applicant Arguments filed 07 July 2008:

Applicant would like to note that while Machida teaches that reducing the resolution of scanned or printed images may modify the amount of data

processed, Machida fails to teach modifying at least the scanning rate or the encoding rate, as recited in independent claims 1 and 42.

Examiner respectfully disagrees.

Wiklof et al. discloses a method and apparatus for illuminating a field-of-view and capturing an image comprising scanning rates ("A 2 D MEMS scanner 108 scans one or more light beams at high speed in a pattern that covers an entire 2 D FOV or a selected region of a 2 D FOV within a frame period. A typical frame rate may be 60 Hz, for example. Often, it is advantageous to run one or both scan axes resonantly. In one embodiment, one axis is run resonantly at about 19 KHz while the other axis is run non-resonantly in a sawtooth pattern to create a progressive scan pattern. A progressively scanned bi-directional approach with a single beam, scanning horizontally at scan frequency of approximately 19 KHz and scanning vertically in sawtooth pattern at 60 Hz can approximate an SVGA resolution. In one such system, the horizontal scan motion is driven electrostatically and the vertical scan motion is driven magnetically. Alternatively, both the horizontal scan may be driven magnetically or capacitively. Electrostatic driving may include electrostatic plates, comb drives or similar approaches. In various embodiments, both axes may be driven sinusoidally or resonantly.") paragraph 0073).

Huffman discloses methods and apparatus for compression of transform data comprising encoding rates ("wherein, defines the compression expression, and R.sup.T defines the compressed coefficient block for transmission. In general, the compression function, , comprises a lossless coder. Any encoding rule may be used for the compression function, , without deviating from the spirit or scope of the invention. For

example, the compression function, , may be implemented with a Rice encoding, function with no run length encoding, Huffman coding with run length encoding, arithmetic encoding, etc. In one embodiment, data not quantized (e.g., the low low ("LL") component of a level) is encoded using Rice encoder, and data quantized, which typically include runs of zeros, is encoded using an arithmetic encoder.") paragraph 0039 ("The client application 460 may also specified criteria for the selection of the quantization value. Specifically, a Q value selection 410 selects a Q value for a specific request. In one embodiment, the quantization bin widths are chosen to optimally minimize the distortion introduced by the quantization process while minimizing the data rate. Although any distribution may be used, the wavelet transform produces high frequency coefficients from most images that exhibit a Laplacian distribution 6 ( e . g . ,  $p(x) = \frac{1}{2} e^{-|x|}$  ").") paragraph 0051).

The examiner has cited particular columns and line numbers in the references as applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider each of the cited references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage disclosed by the examiner.

**Conclusion**

**22.** Any response to this Office Action should be faxed to (571) 273-8300 or mailed to:

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P.O. Box 1450  
Alexandria, VA 22313-1450

Hand-delivered responses should be brought to

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401 Dulany Street  
Alexandria, VA 22314

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Mark Fearer whose telephone number is (571) 270-1770. The Examiner can normally be reached on Monday-Thursday from 7:30am to 5:00pm.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Tonia Dollinger can be reached on (571) 272-4170. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published



applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free) or 571-272-4100.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist/customer service whose telephone number is (571) 272-2600.

Mark Fearer  
/M.D.F./  
October 10, 2008

/Nathan J. Flynn/  
Supervisory Patent Examiner, Art Unit 2454